



Space Operations Mission Directorate 101  
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Program Integration  
May 13, 2009

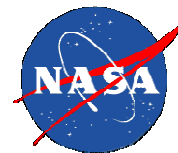


# Space Operations Mission Directorate



- Directs spaceflight operations, space launches and space communications and manages the operation of integrated systems in low Earth orbit and beyond, including the International Space Station.

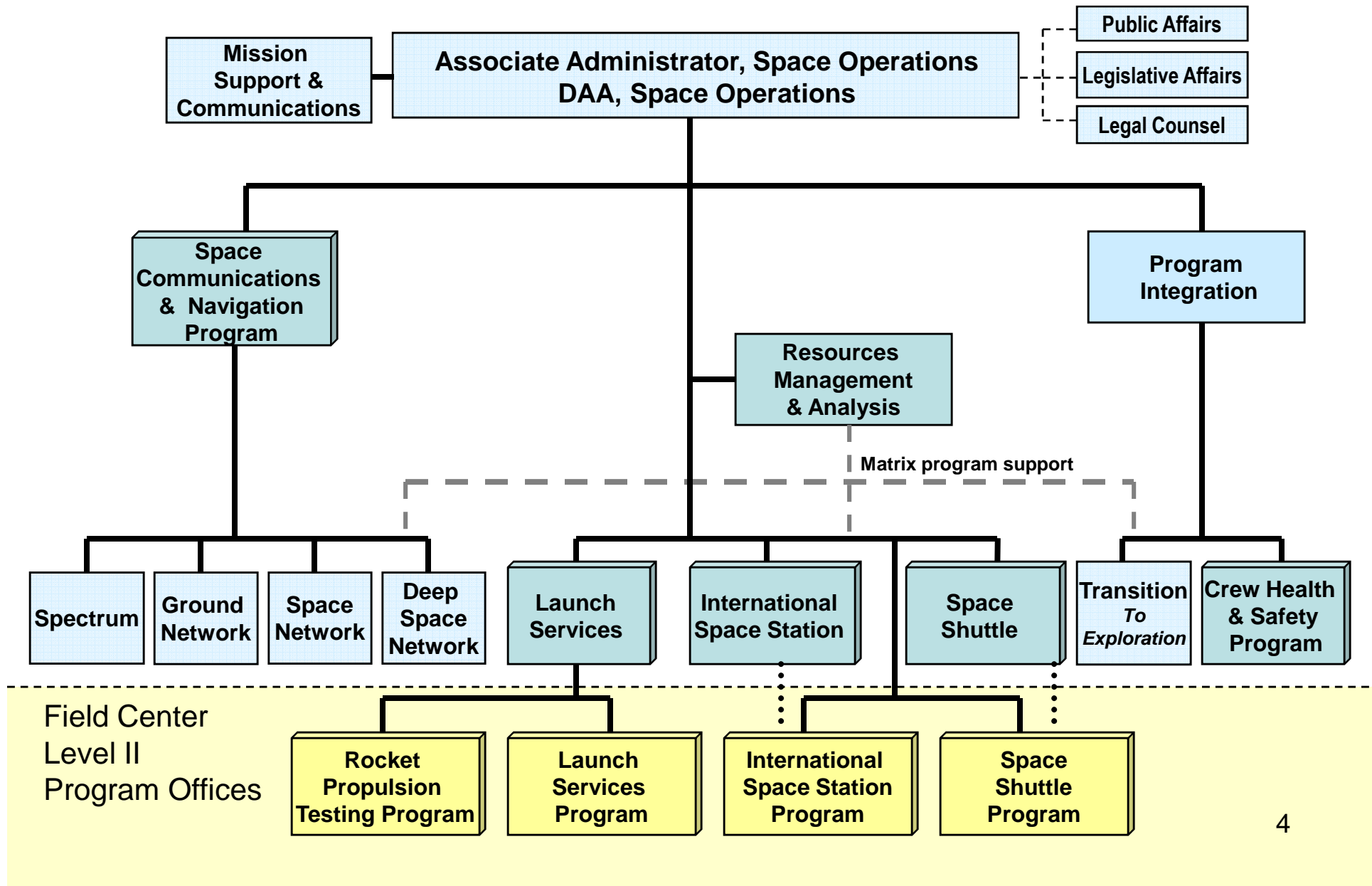
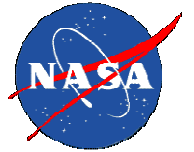
**We enable NASA missions**



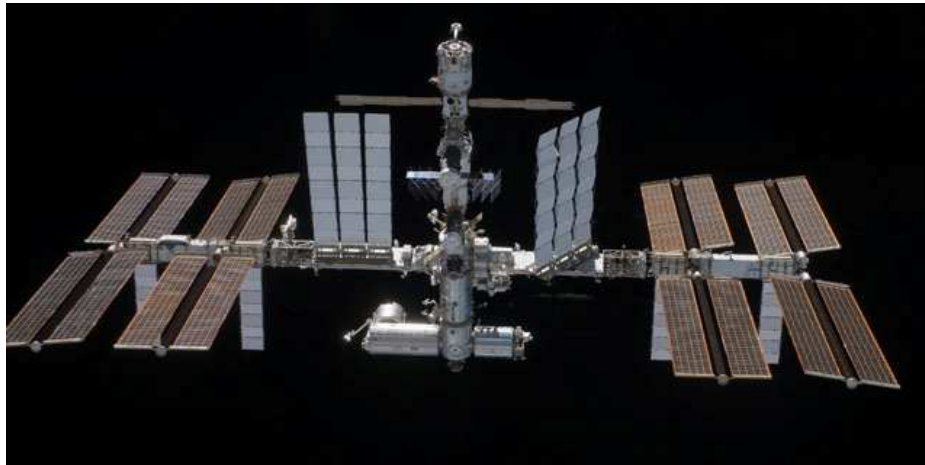
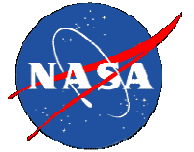
## Key Challenges

- Completing assembly of the International Space Station
- Utilizing, operating and sustaining the International Space Station
- Commercial space launch acquisition; mixed fleet and emerging players
- Future space communications architecture, beginning with TDRS replenishment
- Transition from Shuttle to future space transportation systems

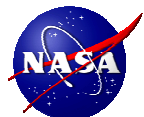
# SOMD Organizational Structure



# International Space Station Overview

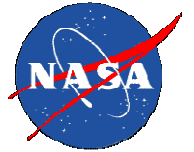


- International Partnership (ESA/JAXA/CSA since 1988, Roskosmos since 1993)
- Builds on long history of international cooperation
- Largest spacecraft ever built
  - 420,500 kg at completion
  - Over 40 assembly flights
- Continuous human presence for more than 9 years (since Expedition 1 in Nov 2000)
  - Currently 3 crew
  - Up to 6 crew in 2009
- International crew
- International launch fleet
- Globally distributed operations<sup>5</sup>



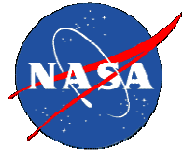


# International Space Station Mission



- Complete ISS assembly
- Provide logistics to operate and maintain the ISS
- Perform research
- Serve as operations testbed for future Exploration missions
- Over 9 years continuously crewed – 19 Expeditions





# Space Shuttle Overview

- World's first reusable heavy-lift spacecraft with many unique capabilities
- 100 mission design life for each orbiter - 125 missions to-date

To complete the Shuttle's mission:

- 10 flights to the ISS
- 1 HST servicing mission
- 2 planned contingency missions

- The Space Shuttle will be retired in 2010

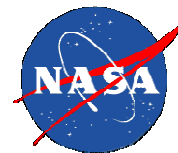
- Shuttle retirement is not about going out of business. Rather, it is about transitioning to a new way of doing business.

- Transition is a combination of transfer and close-out activities. It is big, complex, uncharted, emotional, and expensive

- Shuttle occupies 640 facilities, employs 15,000 people, and has 900,000 line items of associated equipment with total assets valued near \$18B



The highest Shuttle Program priority is safe and effective mission fly-out.



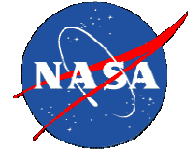
# Launch Services Program

- Acquisition of ELV commercial launch services
- Perform mission assurance activities to maximize successful delivery of spacecraft to space
- Program integration
- Mission analysis and integration
- Encouraging emerging launch service providers





# Rocket Propulsion Test Program

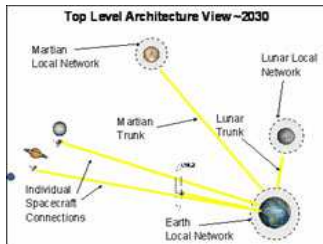


- Develop & Maintain Propulsion Test Facility Management Plan “Right Sized” for current Agency Mission
- Increase DoD/NASA Collaboration & Cross Utilization
- Increase Technical Collaboration Between RPT Centers
  - Cross-training to develop workforce
  - Cross- Utilization of equipment and workforce
  - Common standards and specifications
- Increase Understanding of Facility Maintenance & Operational Requirements



Through ongoing international coordination and cooperation, ensures NASA's critical radiofrequency spectrum is allocated and does not receive intentional

# Space Communications and Navigations



## Systems Planning

- Architecture
- Data Standards
- Search & Rescue
- Technology



## Deep Space Network

- Global tracking stations to provide tracking, telemetry & commanding and navigation data for spacecraft beyond LEO
- Solar System Radar to determine orbits of Near Earth Objects



## Space Network

- Space Network operations & maintenance
- Network Sustaining Engineering
- Network Upgrades



## Space Communications Integration Program

- Constellation Program Integration
- CEV to ISS Comm capability
- Constellation Lunar Comm capability and upgrades



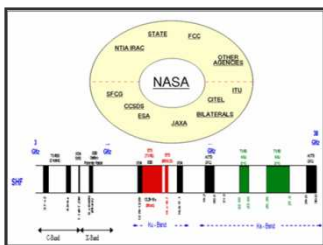
## Tracking & Data Relay Satellite System

- Procuring two replacement satellites



## Near Earth Network (Ground Network)

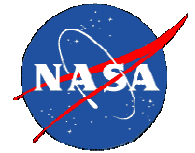
- Global tracking stations to support near Earth space craft
- Provide tracking, telemetry and commanding to support mission operations



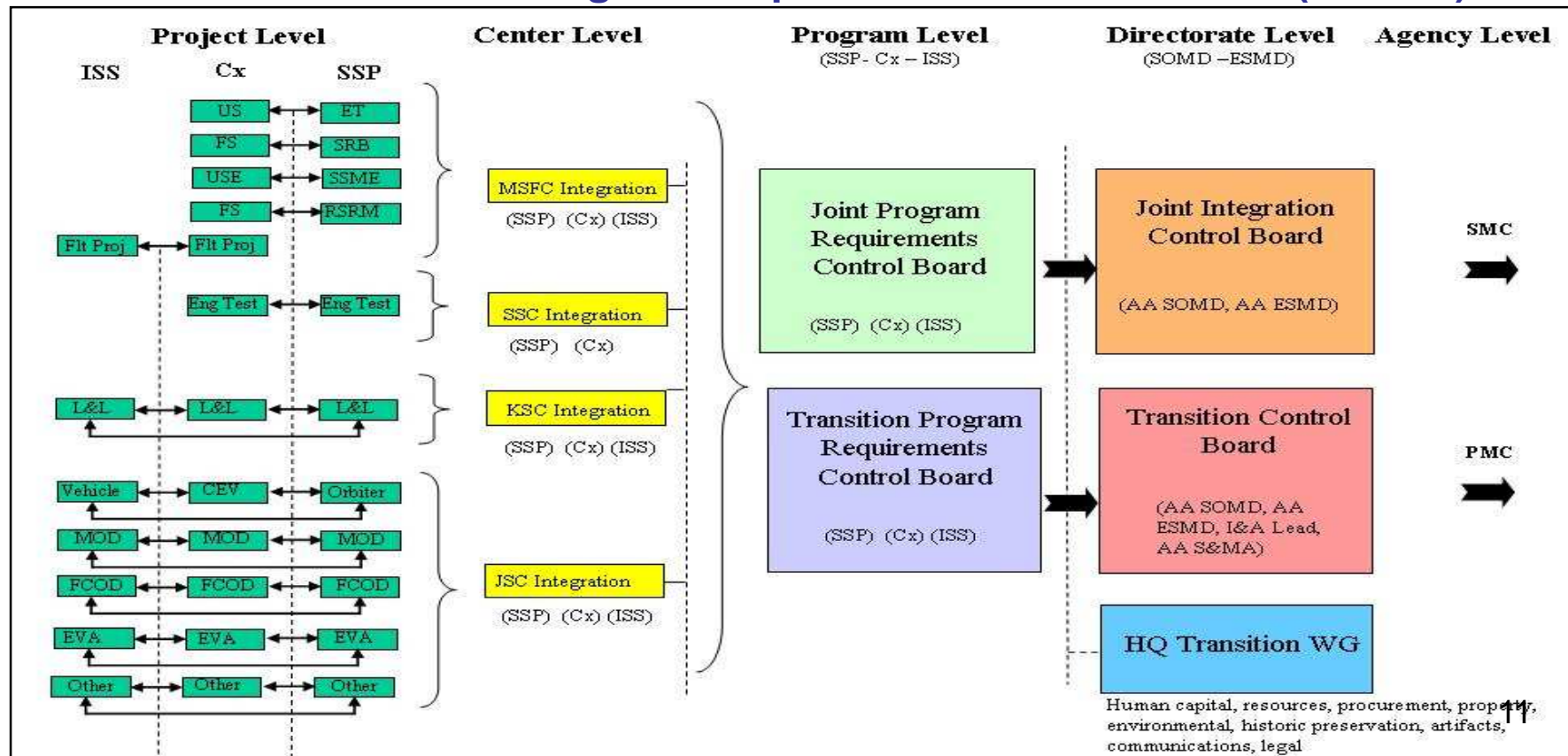
## Spectrum Management

- Through ongoing international coordination and cooperation, ensures NASA's radiofrequency spectrum is allocated and does not receive intentional interference

# Transition Management Board Overview

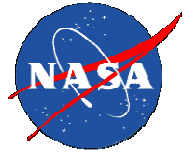


1. Strategic, Longer-term
  - **Joint Integration Control Board (JICB)**
2. Tactical, Near-term
  - **Transition Control Board (TCB)**
3. Program-Level Transition
  - **SSP Transition Program Requirements Control Board (TPRCB)**





# Mission Support and Communications



- Space Flight Awareness
- Public Outreach
- Exhibits
- Communications
- Education
- Guest Operations
- SOMD Website

